



National Aeronautics and Space Administration
Goddard Space Flight Center

Wallops Flight Facility, Wallops Island, Virginia

Inside Wallops

Volume XX-00

Number: 26

June 19, 2000

Back to the Garden: NASA Goes From Plants to Planets

NASA scientists have gone back to the garden, “planting” wireless webs of small sensors in gardens on Earth in preparation for missions to help monitor biological activity on planets.

Sensor webs like those being tested will help make possible a key NASA goal to establish a virtual presence for exploration throughout the solar system.

NASA’s Jet Propulsion Laboratory (JPL), Pasadena, CA, and the Huntington Library, Art Collections, and Botanical Gardens, San Marino, CA, have joined forces to study micro-climates, placing webs in the various specialized gardens at the Huntington.

Like satellites and telescopes remotely “measuring” planets, the webs allow large areas to be monitored. Unlike remote operations, sensor webs are placed inside the environment. For example, satellite measurements cannot penetrate deep below the ocean surface or detect extremely small quantities of gases coming off a planetary surface. The sensor webs could combine the spatial coverage of a satellite with the precision of an on-site instrument.



This pod may someday play a critical role in solar system exploration.

“Sensor webs offer us the means to make sensitive measurements over large areas,” said Dr. Kevin Delin, leader of the Sensor Webs Project at JPL. “A major thrust of our current effort is to develop a sensor web that can detect, identify and monitor any biological activity.”

A sensor web consists of a number of small pods, each housing transducers that collect data from the environment

and communication chips that move the data around the web to primary pods. The information is then transmitted to the Internet or an overhead satellite. “Hopping” the data in short distances from pod to pod makes the overall data transmission more energy efficient. In addition, the “hopped” data is shared by all of the pods, allowing each one to know what is being collected elsewhere on the web.

The pods being tested monitor local temperature, humidity, soil moisture and light levels. Initial observations will take place in a controlled greenhouse environment, then progress to a nursery, and on to overlapping micro-climate areas. Pods are housed in small plastic containers about the size of a sandwich box. Other sensor web pods developed by Delin and Shannon Jackson, also of JPL and the lead engineer on the project, look much like a gumball toy, but contain specialized instruments.

Another advantage to wireless sensor webs is the easy replacement of modules when sensor instruments degrade or batteries fail. New modules, including primary ones, can be added to the web at any time.

Multiple webs deployed in a given area will easily mesh with each other. On Earth, webs could be dropped from an airplane, while for other bodies in the solar system, the webs could be released from spacecraft, fired from a lander, or dropped from a small rover. Another possibility is ballistically driving the modules into the steep sides of a canyon for measurements in inaccessible areas



Wallops Shorts.....

Rocket Launches

A NASA Nike-Orion sounding rocket was successfully launched from Wallops Island on June 13. The student experiment was from Boston University. Dr. Supriya Chakrabarti was the principal investigator. The payload was recovered.

A NASA Orion sounding rocket was successfully launched from Wallops Island on June 18. The SUBorbital Student Experiment Module (Sub-SEM) is part of NASA’s educational outreach initiative. The payload included experiments from Glenbrook North High School, Northbrook, IL; the University of Alaska, Fairbanks; and the University of Arizona, Tempe. The payload was recovered.

Chief, Balloon Program Office

Steve Smith, Jr. has been selected Chief of the Balloon Program Office, (Code 820).

NASA Provides Data for Hurricane Forecasting

June 1 was the official start of the hurricane season and scientists at the National Oceanic and Atmospheric Administration (NOAA) say residents along the East and Gulf Coasts and in the Caribbean should get ready for an above-average Atlantic hurricane season with stronger, longer-lasting storms.

While NOAA’s National Weather Service is the United States’ center for interpretation of data and forecasting, NASA provides many of the tools meteorologists’ use.

Follow the link (<http://www.noaa.gov/>) for more about predictions for the 2000 hurricane season.

June 24, 2000

9 a..m. to 5 p.m.

Tour Sounding Rocket Payload Facility
NASA and Military Aircraft
Navy Seal Dive Tank
Navy Band
Coast Guard Drill Team
Coast Guard Sponsored NASCAR
NASA Benefits of Space Trailer Exhibits
NASA Ford Diagonal-Braked Vehicle
NASA Mobile Control Center
Fire Department Demo
Children’s Activity Tent
Model Rocket Launch
Wallops Island Driving Tour
Navy AEGIS Tour

Message From the Administrator

Chemical Hazards

The aerospace industry is known for having an extremely complex chemical environment. Demand for decreasing product development flow time, combined with increasingly stringent performance criteria, may cause an imbalance between performance testing and environmental health testing.

NASA’s inventory includes approximately 17,000 chemical products, including composites, metals, organic compounds, plastics, fibrogenic dusts and benign dusts. We have one of the most chemically complex workplaces in the world.

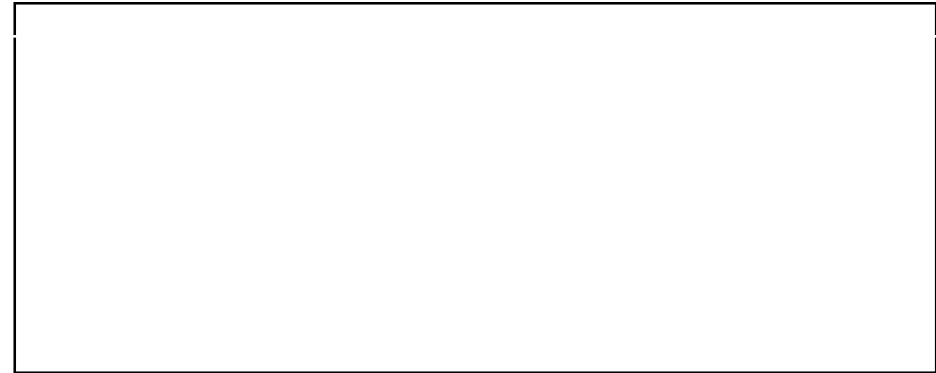
The potential for exposure to extremely hazardous fuels, oxidizers and propellants including hydrazine, nitrogen tetroxide and hydrogen exists in our launch operations. Routine maintenance operations could result in exposure to materials such as asbestos, lead coatings and polychlorinated biphenyl dielectric fluids. The list of potential exposures is extensive.

Although NASA Centers maintain high standards for workplace safety, new technologies and procedures are introduced with almost every mission. Hazards to employees and the environment are ever-changing. Safety is achievable but only if employees understand the hazards associated with their work and strive to minimize them. We must pay constant attention to the production and handling of hazardous chemicals as well as to their storage, transport and disposal.

One of our biggest challenges is the early identification of potential material substitutions. The goal is to replace a hazardous material with a nontoxic or less toxic one. The scientific and research communities help us identify potentially hazardous situations, and chemical safety experts assist us in identifying appropriate engineering controls and protective measures.

NASA’s Chemical Hazard Communication Program includes specific procedures that provide for a complete inventory of hazardous chemicals, with each chemical cross-referenced to the corresponding Material Safety Data Sheets (MSDS). The program also includes an explanation of the cross-referencing, labeling system and MSDS format to be used, along with a training program for employees using or potentially exposed to hazardous chemicals.

We must prepare for the highest, reasonably expected risk and provide appropriate protective measures and make hazard communication training and high-quality information on MSDS’s immediately accessible at every NASA or contractor work-site.



Microgravity Man Visits Wallops

NASA’s Microgravity Man visited Wallops during Student Launch Week to inspire and encourage the students in scientific endeavors of all disciplines. Microgravity Man, Dennis Stockton, when not acting as a spokesman for NASA, is a scientist at NASA’s Glenn Research Center.

Working in partnership with the scientific community and commercial industry, NASA’s Microgravity Research Program strives to increase understanding of the effects of gravity on biological, chemical and physical systems.

NASA has performed Microgravity research for more than 25 years. The term “microgravity” literally means a state of very little gravity. The prefix “micro” comes from the Greek word mikros, meaning “small.”



“Microgravity Man”
Dennis Stockton

Using both space flight and ground-based experiments, researchers throughout the nation, as well as international partners, are working together to benefit economic, social and industrial aspects of life for the United States and the entire Earth.

Students from Alaska, Iowa, Illinois and Washington, winners of an academic competition as part of the NASA Student Involvement Program (NSIP) were at Wallops the week of June 5. Their entries were selected for a flight opportunity in the Space Experiment Module (SEM) on an upcoming Space Shuttle flight.



PAO Digital Photo.
Students from Glenbrook North High School, Northbrook, IL; the University of Alaska, Fairbanks; and the University of Arizona, Tempe with the Orion Sub-SEM student rocket that was launched on June 18. The payload was recovered.



Ed White (left) and Michael Sharpe, PRC, with the Sub-SEM payload that was recovered and returned to Wallops by the recovery vessel, “Thomas Reed”.

PAO Digital Photo.

Mark your calendar:

July 25 --
Eastern Shore Blood Drive

Inside Wallops is an official publication of Goddard Space Flight Center and is published by the Wallops Office of Public Affairs, Extension 1584, in the interest of Wallops employees.

Editor: Betty Flowers
Printing: Printing Management Office

<http://www.wff.nasa.gov>